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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/084,925	03/01/2002	Takashi Nikami	020277	7137

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EXAMINER

VU, QUANG D

ART UNIT PAPER NUMBER

2811

DATE MAILED: 03/13/2003

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/084,925

Applicant(s)

NIKAMI, TAKASHI

Examiner

Quang D Vu

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on amendment filed on 01/02/03.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-4 and 6-9 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-3, 6 and 7 is/are rejected.
- 7) ☒ Claim(s) 4, 8 and 9 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892) 4) ☐ Interview Summary (PTO-413) Paper No(s). _____
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948) 5) ☐ Notice of Informal Patent Application (PTO-152)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449) Paper No(s) _____ 6) ☐ Other: _____

DETAILED ACTION

Specification

The disclosure is objected to because of the following informalities: On page 11, lines 15-17, the phrase “Fig. 5A...fig. 3” is unclear. Fig. 2 discloses a non-LDD FET. However, figs. 5A-5F disclose a LDD FET. It is unclear how the device of fig. 3 is formed by the method of figs. 5A-5F. On page 3, the phrase “fig. 4 is a cross-sectional view of a semiconductor device fabricated by a fabricating method in fig. 5A to fig. 5F” is unclear. Figs. 5A to fig. 5F disclose an example of a method for fabricating the semiconductor device shown in fig. 1 to fig. 3. However, Fig. 4 is directed to a cross-sectional view of a device having a pn junction gate electrode different from fig. 3. Fig. 3 and fig. 4 are directed to different devices. Appropriate correction is required.

Claim Rejections - 35 USC § 102

1. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

2. Claims 1-3 are rejected under 35 U.S.C. 102(b) as being anticipated by US Patent No. 5,466,958 to Kakumu.

Regarding claim 1, Kakumu (figure 7) teaches a semiconductor device, comprising:
a source region (706) formed of a semiconductor;

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a drain region (708) formed of a semiconductor of the same conductive type as that of the source region;

a channel region (705) formed of a semiconductor between the source region and the drain region;

a gate insulating film (702) provided on the channel region (705); and

a gate electrode (712, 703) provided on the gate insulating film (702) and formed with a P-N junction including a P-type semiconductor region (712) and an N-type semiconductor region (703),

wherein the P-type semiconductor region (712) and the N-type semiconductor region (703) of the P-N junction of the gate electrode are electrically insulated,

wherein the gate electrode (712, 703) includes a first gate portion (the central portion of electrode [703]) provided above the channel region (705) and a second gate portion (a side portion of electrode [703] and the electrode [712]) provided above a region (709) which is not the channel region, and the second gate portion includes the P-N junction.

Regarding claim 2, Kakumu teaches silicide is not formed on the P-N junction of the gate electrode (712, 703).

Regarding claim 3, Kakumu teaches the P-N junction of the gate electrode (712, 703) is covered with an insulating material (710).

Claim Rejections - 35 USC § 103

3. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

4. Claim 6 is rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 5,466,958 to Kakumu in view of US Patent No. 5,144,390 to Matloubian.

Regarding claim 6, Kakumu teaches a body region (704) formed of a semiconductor under the channel region (705). Kakumu differs from the claimed invention by not showing a buried insulating film provided under the body region, the source region, and the drain region; and a semiconductor substrate region provided under the buried insulating film. However, Matloubian (figure 2) teaches a buried insulating film (4) provided under the body region (12), the source region (6), and the drain region (8); and a semiconductor substrate region (2) provided under the buried insulating film (4). Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to incorporate the SOI structure of Matloubian into the device taught by Kakumu because it supports the substrate of the device. Additionally, the SOI technology is well suited for high performance and high-density integrated circuits.

5. Claim 7 is rejected under 35 U.S.C. 103(a) as being unpatentable over US Patent No. 5,466,958 to Kakumu in view of US Patent No. 6,413,829 to Yu.

Regarding claim 7, Kakumu differs from the claimed invention by not showing the silicide is formed on surfaces of the source region and the drain region. However, Yu (figure 1) teaches the silicides (110, 114) are formed on surfaces of the source region (112) and the drain region (108). Therefore, it would have been obvious to one having ordinary skill in the art at the

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time the invention was made to incorporate the source and drain silicides of Yu into the device taught by Kakumu because they reduce the sheet resistance of the source and drain regions.

Allowable Subject Matter

Claims 4 and 8-9 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quang D Vu whose telephone number is 703-305-3826. The examiner can normally be reached on Monday-Friday.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Thomas can be reached on 703-308-2772. The fax phone numbers for the organization where this application or proceeding is assigned are 703-308-7722 for regular communications and 703-308-7722 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is 703-308-0956.

qv
March 10, 2003

Steven Loh